

WHAT IS CLAIMED IS:

1. A method for making an electro-optic device, the method comprising:
forming a first component comprising at least one first material on a first substrate;
forming a second component comprising at least one second material on a second substrate, wherein at least one opening is formed through the second component;
forming a third component; and
laminating the first component, the second component and the third component together such that
the second component is located between the first component and the third component,
the at least one first material and the at least one second material form at least part of an organic electro-optic device located between the first substrate and the second substrate,
the third component is bonded to the second component, and
the third component is bonded to the first component through the at least one opening.
2. The method according to claim 1, wherein the organic electro-optic device is a light emitting device.
3. The method according to claim 1, wherein the organic electro-optic device is a photovoltaic device.

4. The method according to claim 1, wherein the at least one first material or the at least one second material comprises at least one of:

an organic light emissive material;
a light-absorbing photovoltaic material;
a charge transport material; and
an electrode material.

5. The method according to claim 1, wherein the at least one first material or the at least one second material comprises one or more of the following electroluminescent materials:

poly(p-phenylene vinylenes),
polyphenylenes,
polythiophene,
polyquinolines,
polyfluorenes,
poly(vinylcarbazole),
polystyrene with quaterphenylene segments,
poly(disilanyleneoligothienylene),
tris(8-quinolinolato)aluminum, and
coumarin.

6. The method according to claim 1, wherein the at least one opening through the second component is substantially perpendicular to the second substrate.

7. The method according to claim 1, wherein the at least one opening through the second component comprises a grid of regularly spaced openings.
8. The method according to claim 1, wherein the third component comprises at least one adhesive material that forms a bond to the second component and the first component.
9. The method according to claim 8, wherein the at least one adhesive material comprises a thermoplastic film.
10. The method according to claim 8, wherein the at least one adhesive material comprises one or more of:
- epoxy;
 - acrylate;
 - acrylimide;
 - isocyanate;
 - polyurethane;
 - melamine formaldehyde; or
 - unsaturated polyester.
11. The method according to claim 1, wherein the third component comprises at least one electrically conductive material that provides electrical interconnection among the first component, the second component and the third component through

the at least one opening.

12. The method according to claim 11, wherein the at least one electrically conductive material comprises a conductive epoxy.

13. The method according to claim 1, wherein the third component comprises at least one color-modifying material that can modify one or more emission colors of the organic light emitting device.

14. The method according to claim 13, wherein the at least one color-modifying material comprises a plurality of down-conversion phosphor layers.

15. The method according to claim 1, wherein the third component comprises a plurality of scattering particles to enhance the light-extraction efficiency of the organic electro-optic device.

16. The method according to claim 1, wherein the step of laminating the first component, the second component and the third component together comprises:

laminating the first component and the second component together to form an intermediate structure; and

laminating the third component with the intermediate structure.

17. The method according to claim 1, wherein the step of laminating the first component, the second component and the third component together comprises:

laminating the second component and the third component together to form an intermediate structure; and

laminating the first component with the intermediate structure.

18. The method according to claim 1, where the first component or the second component comprises at least one organic light emissive material mixed with at least one adhesive material.

19. An electro-optic device comprising:

a first component comprising at least one first material on a first substrate;

a second component comprising at least one second material on a second substrate, wherein there is at least one opening formed through the second component; and

a third component;

the first component, the second component and the third component being laminated together such that

the second component is located between the first component and the third component,

the at least one first material and the at least one second material form at least part of an organic electro-optic device located between the first substrate and the second substrate,

the third component is bonded to the second component, and

the third component is bonded to the first component through the at least one opening.

20. The electro-optic device according to claim 19, wherein the organic electro-optic device is a light emitting device.
21. The electro-optic device according to claim 19, wherein the organic electro-optic device is a photovoltaic device.
22. The electro-optic device according to claim 19, wherein the at least one first material or the at least one second material comprises at least one of:
- an organic light emissive material;
 - a light-absorbing photovoltaic material;
 - a charge transport material; and
 - an electrode material.
23. The electro-optic device according to claim 19, wherein the at least one first material or the at least one second material comprises one or more of the following electroluminescent materials:
- poly(p-phenylene vinylenes),
 - polyphenylenes,
 - polythiophene,
 - polyquinolines,
 - polyfluorenes,
 - poly(vinylcarbazole),
 - polystyrene with quaterphenylene segments,

poly(disilanyleneoligothienylene),
tris(8-quinolinolato)aluminum, and
coumarin.

24. The electro-optic device according to claim 19, wherein the at least one opening through the second component is substantially perpendicular to the second substrate.

25. The electro-optic device according to claim 19, wherein the at least one opening through the second component comprises a grid of regularly spaced openings.

26. The electro-optic device according to claim 19, wherein the third component comprises at least one adhesive material that forms a substantial bond to the second substrate and the first component.

27. The electro-optic device according to claim 26, wherein the at least one adhesive material comprises a thermoplastic film.

28. The electro-optic device according to claim 26, wherein the at least one adhesive material comprises one or more of:

epoxy;

acrylate;

acrylimide;

isocyanate;
 polyurethane;
 melamine formaldehyde; or
 unsaturated polyester.

29. The electro-optic device according to claim 19, wherein the third component comprises at least one electrically conductive material that provides electrical interconnection among the first component, the second component and the third component through the at least one opening.

30. The electro-optic device according to claim 29, wherein the at least one electrically conductive material comprises a conductive epoxy.

31. The electro-optic device according to claim 19, wherein the third component comprises at least one color-modifying material that can modify one or more emission colors of the organic light emitting device.

32. The electro-optic device according to claim 31, wherein the at least one color-modifying material comprises a plurality of down-conversion phosphor layers.

33. The electro-optic device according to claim 19, wherein the third component comprises a plurality of scattering particles to enhance the light-extraction efficiency of the electro-optic device.

34. The electro-optic device according to claim 19, where the first component or the second component comprises at least one organic light emissive material mixed with at least one adhesive material.

35. A method for making an electro-optic device, the method comprising:

- forming a first component comprising at least one first material on a first substrate;
- forming a second component comprising at least one second material on a second substrate;
- forming a third component, where the first component and the third component are larger in area than the second component; and
- laminating the first component, the second component and the third component together such that
 - the third component is bonded to the first component in locations that are beyond the edges of the second component,
 - the second component is located between and encapsulated by the first component and the third component, and
 - the at least one first material and the at least one second material form at least part of an organic electro-optic device located between the first substrate and the second substrate.

36. The method according to claim 35, wherein the organic electro-optic device is a light emitting device.

37. The method according to claim 35, wherein the organic electro-optic device is a photovoltaic device.

38. An electro-optic device comprising:

- a first component comprising at least one first material on a first substrate;
- a second component comprising at least one second material on a second substrate;
- a third component, where the first component and the third component are larger in area than the second component;
- the first component, the second component and the third component being laminated together such that
- the third component is bonded to the first component in locations that are beyond the edges of the second component,
- the second component is located between and encapsulated by the first component and the third component, and
- the at least one first material and the at least one second material form at least part of an organic electro-optic device located between the first substrate and the second substrate.

39. The electro-optic device according to claim 38, wherein the organic electro-optic device is a light emitting device.

40. The electro-optic device according to claim 38, wherein the organic electro-optic device is a photovoltaic device.

41. A method for making an organic light emitting device, the method comprising:
forming at least one composite by mixing at least one organic light emissive material with at least one adhesive material; and
forming an organic light emitting device using the at least one composite as a layer in the organic light emitting device.
42. The method according to claim 41, wherein the at least one adhesive material and the at least one organic light emissive material are soluble in a same solvent or a mixture of at least two miscible solvents.
43. The method according to claim 41, wherein the at least one composite is formed by a method selected from a group consisting of spin-coating, spray coating, dip coating, screen printing, ink-jet printing and roller coating.
44. The method according to claim 41, wherein the at least one adhesive material is transparent to a light emitted from the at least one organic light emissive material.
45. The method according to claim 41, wherein the at least one adhesive material is cured under an ultra-violet (UV) irradiation.
46. The method according to claim 41, wherein the at least one adhesive material is cured at a temperature between approximately 50°C and approximately 250°C.

47. The method according to claim 41, wherein the at least one organic light emissive material is the most abundant material on a weight basis in the at least one composite.

48. An organic light emitting device comprising at least one composite layer, wherein the at least one composite layer comprises at least one organic light emissive material mixed with at least one adhesive material.

49. The organic light emitting device according to claim 48, wherein the at least one organic light emissive material comprises one or more of:

poly(p-phenylene vinylenes),
polyphenylenes,
polythiophene,
polyquinolines,
polyfluorenes,
poly(vinylcarbazole),
polystyrene with quaterphenylene segments,
poly(disilanyleneoligothienylene),
tris(8-quinolinolato)aluminum, and
coumarin.

50. The organic light emitting device according to claim 48, wherein the at least one adhesive material comprises one or more of:

epoxy;
acrylate;
acrylimide;
isocyanate;
polyurethane;
melamine formaldehyde; or
unsaturated polyester.

51. The organic light emitting device according to claim 48, wherein the at least one adhesive material and the at least one organic light emissive material are soluble in a same solvent or a mixture of at least two miscible solvents.

52. The organic light emitting device according to claim 48, wherein the at least one composite is formed by a method selected from a group consisting of spin-coating, spray coating, dip coating, screen printing, ink-jet printing and roller coating.

53. The organic light emitting device according to claim 48, wherein the at least one adhesive material is transparent to a light emitted from the at least one organic light emissive material.

54. The organic light emitting device according to claim 48, wherein the at least one adhesive material is cured under an ultra-violet (UV) irradiation.

55. The organic light emitting device according to claim 48, wherein the at least one adhesive material is cured at a temperature between approximately 50°C and approximately 250°C.

56. The organic light emitting device according to claim 48, wherein the at least one organic light emissive material is the most abundant material on a weight basis in the at least one composite.